Empathic veterinarians score cattle pain higher

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ABSTRACT

The treatment of cattle pain often relies upon veterinarians. The aim of this study was to qualify the influence of veterinarians skills, attitudes, and empathy on cattle pain assesment and consequently disbudding pain management. A web-based questionnaire was sent to Finnish veterinary students in either the preclinical or clinical stage, and also to production-animal practice oriented veterinarians. The questionnaire recorded demographics, statements of opinions, pain scoring of cattle conditions and procedures. Empathy towards humans (Interpersonal Reactivity Index, IRI) and reworded IRI to measure empathy towards animals were also covered.

The overall response rate was approximately 40%. The association between pain and empathy scores were analyzed by Pearsońs correlation, and the factors affecting pain scores and empathy towards animals analyzed using linear models. The need for pain medication of calves during disbudding was well recognized and the intention to treat such pain was very common. Higher mean scores for cattle pain were associated with greater empathy towards humans. On average, respondents' empathy towards animals was greater than towards humans, and was associated with respondents' empathy towards humans, family size and attachment to family pet.

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Introduction

Recognition of animal pain is an essential prerequisite for the treatment of pain in animals (Paul and Podberscek, 2000; Huxley and Whay, 2006; Hewson et al., 2007a). The scoring of animal pain depends on veterinary medical education, attitudes to animal pain, sex, age and empathy of the individual (Capner et al., 1999; Raekallio et al., 2003; Huxley and Whay, 2006; Ellingsen et al., 2010; Fajt et al., 2011).

Empathy is considered a measurable trait and one common approach to its assessment is the Interpersonal Reactivity Index (IRI) self-evaluating questionnaire (Davis, 1980) for which empathic concern (EC) and perspective taking (PT) factors are considered to be the most relevant (Davis, 1983; Alterman et al., 2003; Pedersen, 2009). Variation in empathy skills seems to be associated with the haemodynamic brain responses of subjects while observing non-verbal signs of pain (Saarela et al., 2007). Additionally, physiological changes in the brain seem to be similar whether the subjects are experiencing or witnessing pain (Morrison et al., 2004; Corradi-Dell'Acqua et al., 2011; Lamm et al., 2011).

There is limited information on how empathy towards animals can be measured. Paul (2000) modified the questionnaire created by Mehrabian and Epstein (1972) into a tool for measuring empathy towards animals and this has been used by other researchers (Taylor et al., 2004; Ellingsen et al., 2010). Angantyr et al. (2011) used a narrative technique to measure animal-oriented empathy. In addition, alterations in skin conductance and heart function as a physiological sign of empathetic reactions have been associated with watching movies of animals in trouble (Westbury and Neumann, 2008).

Empathy is modulated by the features of the target and the relationship between the empathizer and the target (Vignemont and Singer, 2006; Avenanti et al., 2010). The question to be answered about empathy towards animals is how alike do we feel or how close a relationship do we feel we have with them? In the absence of published studies we can only assume that veterinarians have a high level of empathy for animals compared to the general population due to their choice of occupation. However, empathy scores usually decline during the course of education in both human doctors (Neumann et al., 2011) and veterinarians (Hazel et al., 2011). In addition, habituation to non-verbal pain signs has been shown to occur among human health care professionals (Cheng et al., 2007). Empathy is also affected by sex, with females having been

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shown to be more empathic towards animals and to score their pain higher (Capner et al., 1999; Paul and Podberscek, 2000; Huxley and Whay, 2006; Kielland et al., 2009). Women also out-perform men in detection of facial cues of pain (Prkachin et al., 2004).

In human medicine empathy is considered important because it facilitates the acquisition of information for diagnoses and the transmission of therapies (Neumann et al., 2011). For production animal medicine we hypothesized that veterinarians perception and intention treat disbudding pain may be enhanced by their empathetic abilites.

The aim of this study was to examine the attitudes of Finnish veterinary students and production animal veterinarians to pain management in cattle. Sensitivity to animal pain was assessed by questions about pain scoring and empathy towards animals. In addition, the effects of sex, education, work-experience and empathy for humans were evaluated as potential contributing factors towards pain recognition.

Materials and methods

A web-based questionnaire was sent to Finnish veterinarians and veterinary students pursuing degree or oppourtunities for continuing education. The questionnaire was delivered via e-mail to students in the preclinical stage (1st and 2nd years), to students in the clinical stage (5th and 6th years), and to production animal oriented veterinarians. One reminder e-mail was sent.

The questionnaire began by explaining the aim of the survey and an estimation of the time required. In addition, the voluntary nature of the responding and the anonymous handling of the data were emphasized. The first questions were demographic including questions concerning relations to animals and ownership of a pet. In the next section the respondents indicated which of the following they would choose to treat disbudding pain in calves: (1) sedation; (2) oral or injectable analgesics (all analgesic substances registered for pain treatment of calves in Finland are non-steroidal anti-inflammatory drugs); (3) local anaesthetics. This section was followed by statements about pain in cattle to agree or disagree using a 5-point Likert scale. Respondents were then asked to rate the painfulness of 13 named conditions or procedures of cattle, on a scale ranging from 0 to 10.

The last section of the questionnaire consisted of Interpersonal Reactivity Index (IRI) statements (Davis, 1980) and the perspective taking (PT) and empathic concern (EC) subscales of the IRI were reworded to obtain a measurement of empathy towards animals. Empathy statements were scored on a 5-point scale ranging from 0 to 4. Altogether, the questionnaire included 99 closed questions.

Statistical analysis

The relationship between mean pain scores, human IRI empathy scores and empathy for animals IRI were analyzed using Pearson's correlation. The differences between empathy towards animals and humans were analyzed by using a paired samples t test.

Factors affecting pain scores and scores of empathy towards animals were analyzed using two separate linear models. Years of education, experience as a veterinarian, affection for family pet, family size and scores of empathy for humans were inserted as covariates, while sex of the respondent was inserted as a fixed effect. PASW 18 (IBM) was used for the analysis.

Results

In total, 189 responses were received. Approximately 42% of students in the preclinical and 42% of students in the clinical stages, and 40% of veterinarians responded. The majority of respondents were female (172 vs. 17). The age of respondents ranged from 19 to 67 years (Table 1). Pet ownership was very common and only 11 respondents recorded that they had never had a pet.

Of the veterinarians and clinical stage students, 93 per cent (n = 127) said they would use sedation, local anaesthetics and analgesia for treating disbudding pain. Moreover, 88 per cent of the veterinarians and clinical phase students strongly disagreed with the statement: "*Calf requires no pain medication for disbudding*" (Table 2). The respondents evaluated disbudding pain without analgesia as one of the highest scored pains in the survey (Fig. 1).

Respondents with higher human empathy scores scored the pain associated with the conditions or procedures higher; there was an increase of 0.01 (95% confidence interval 0.00–0.02) in pain score for an increase of 1 in the IRI sum score (P = 0.035). Education level, experience as veterinarian, sex, affection for a family pet and family size had no effect on respondents' pain scores.

Empathy towards animals was positively associated with human empathy scores (P = 0.001, slope 0.29 animal IRI sum score/IRI sum score; 95% CI 0.21–0.36), greater attachment to the family pet (P = 0.001, slope 1.7 animal IRI sum score/Likert score; 95% CI 0.9–2.4) and with a larger family size (P = 0.032, slope 0.7 animal IRI sum score/family member; 95% CI 0.1–1.4). Education level, experience as a veterinarian, or sex had no effect on empathy towards animals. Mean scores of empathy towards animals are shown in Table 3.

On average, scores of empathy towards animals were higher compared to empathy towards humans (Table 4). The mean pain scores, empathy subscales and empathy towards animals were all positively correlated with each other (Table 5).

Discussion

In this study we found that the empathy skills of veterinarians had an effect on their pain scoring. Veterinarians seemed to be more empathetic towards animals than towards humans. Empathy towards humans was positively associated with pain scores and we were able to infer a positive association between self-reported empathy towards animals and pain scoring of cattle. A similar association of empathy towards animals and dog pain rating has been previously shown for dog owners (Ellingsen et al., 2010). Along the same line, empathy has been previously associated with higher pain scores assigned for humans (Green et al., 2009).

Human and animal oriented empathy were associated with each other, but only moderately, which indicated that other factors also affect empathy towards animals. Empathy towards animals was positively associated with a greater empathy overall but also with an attachment to a family pet. Having a pet has been previously associated with animal empathy and higher scores for animal pain recognition (Paul, 2000; Ellingsen et al., 2010). Current and past pet ownership were very common among our study population, so affection for the family pet was measured in order to get information about the closeness of relationship to animals. Frequent kissing of pet dog has been linked with higher oxytocin concentrations of owners (Handlin et al., 2012), perhaps clarifying the mechanisms behind the association between pet ownership and

Table 1
Demographic background of respondents (mean ± SD).

	All together	Preclinical students	Clinical students	Graduated veterinarians
Number of respondents	189	62	57	70
Age	31 ± 11	23 ± 4	26 ± 2	42 ± 10
Family size	2.5 ± 1.6	2.4 ± 1.7	1.6 ± 0.8	3.3 ± 1.5
Years of education	17 ± 3	14 ± 2	18 ± 3	20 ± 3
Years of experience as a veterinarians	5 ± 9	0 ± 0	0 ± 1	14 ± 10

Table 2
The opinions of Finnish veterinarians and students rated on a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree).

Statements	Mean ± SD
Animal welfare is important to me in my work	4.9 ± 0.5
Disbudding without medication causes pain to the calf	4.8 ± 0.7
Production animals are as sensitive to pain as pets	4.8 ± 0.6
Animal is my dearest family member	2.3 ± 1.3
The calf requires no pain medication for disbudding	1.2 ± 0.6

empathy towards animals. This also suggests that there is a general link between emotional attachment to one individual pet and empathy towards all animals instead of sensitivity being driven by merely attitudes towards animals.

We found an association between empathy towards animals and larger family size of respondents. This finding is in agreement with the results of Kielland et al. (2009), who found that having a larger number of siblings was associated with higher pain scores. However, Paul (2000) reported that having a child at home did not have an effect on animal oriented empathy, and Ellingsen et al. (2010) reported an inverse association between a household size and empathy towards animals. These results indicate that more detailed analysis is needed of the interactions between family size, relationships within family units, and empathy towards animals.

Finnish veterinarians and the veterinary students in our study showed higher empathy scores towards animals as measured by modified IRI questionnaire compared to how they scored with the traditional IRI questionnaire. In earlier studies that used different methods, animal directed empathy has also been found to be greater than human-directed empathy (Paul, 2000; Angantyr et al., 2011). Although our scores for IRI were lower than those reported by Daly and Morton (2009) and by Hazel et al. (2011), they were in accordance with another Finnish study by Silfver and Helkama (2007). Lower scores obtained from Finnish studies possibly reflect cultural differences between nationalities in this respect (Silfver-Kuhalampi, 2009).

According to our results, most veterinarians and clinical phase students would treat cattle disbudding pain with sedation, analgesics and local anaesthetics, according to the current best practice
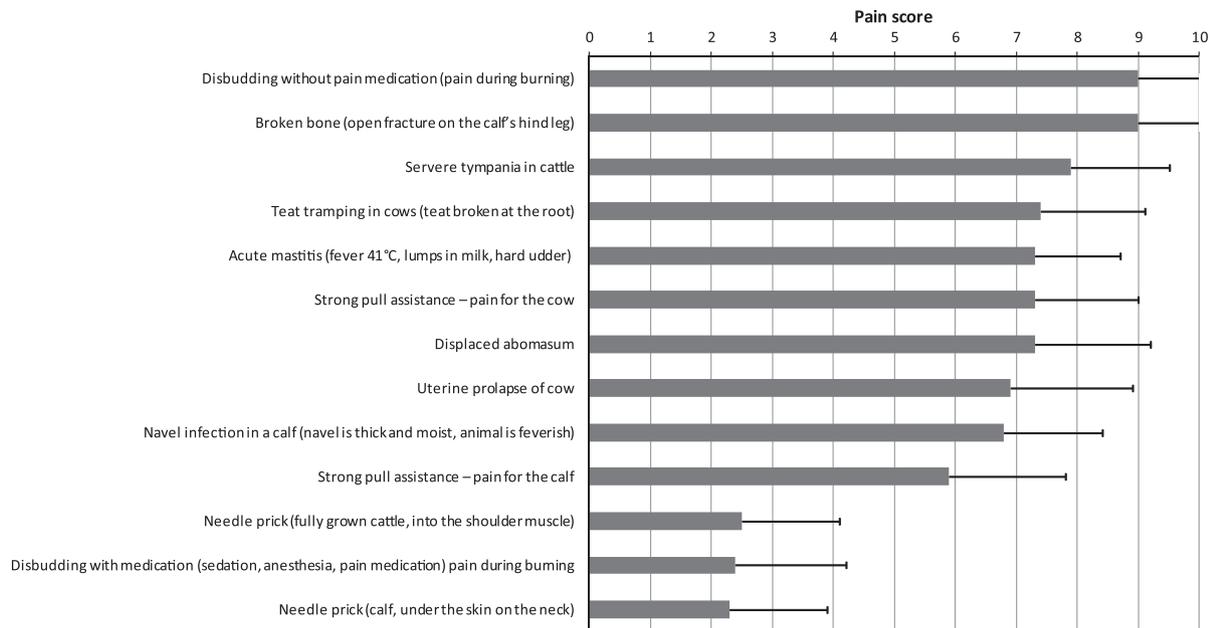

Fig. 1. The mean pain scores (SD) given by Finnish veterinarians and students. Respondents were asked to score painful conditions and procedures on scale from 0 (no pain) to 10 (worst pain imaginable).

Table 3
Animal IRI reworded for this study and mean scores (±SD).

I often have tender, concerned feelings for animals less fortunate than others. A-EC	2.5 ± 1.0
I sometimes find it difficult to see things from the animals point to view. A-PT—	2.8 ± 1.0
Sometimes I don't feel very sorry for animals when they have problems or suffer. A-EC—	3.2 ± 1.0
I try to understand the reasons behind an animal's undesired behaviour before making a decision. A-PT	3.2 ± 0.7
When I see an animal being treated badly, I feel protective towards it. A-EC	3.4 ± 0.7
I sometimes try to understand animals better by imagining how things look from their perspective. A-PT	2.9 ± 0.9
Animals' misfortunes do not usually disturb me a great deal. A-EC—	3.3 ± 0.8
If I'm sure I'm right about how to handle an animal, I don't waste time trying to think what might be causing the animals behaviour. A-PT—	2.2 ± 1.0
When I see animals being treated unfairly, I sometimes don't feel very much pity for them. A-EC—	3.5 ± 0.7
I am often quite touched by things that I see happen. A-EC	2.4 ± 1.0
I believe that there are two sides to every question and try to look at them both. A-PT	2.8 ± 0.8
I would describe myself as an animal lover. A-EC	3.4 ± 0.9
When I am disappointed or angry because of how an animal behaves, I usually try to put myself in its place for a while. A-PT	2.7 ± 0.8
Before scolding an animal, I try to imagine how I would feel if I were in its place. A-PT	2.0 ± 1.0

A-PT, animal directed perspective taking; A-EC, animal directed empathic concern; —, reversed scoring.
5-point scale (0 = does not describe me, 4 = describes me well).
Original Finnish questionnaire translated.

Table 4

Empathy towards humans and towards animals using the Interpersonal Reactivity Index (IRI).

	Human	Animal
IRI FS fantasy	17 ± 6	–
IRI PD personal distress	11 ± 4	–
IRI EC empathic concern	19 ± 4	22 ± 4 [*]
IRI PT perspective taking	17 ± 4	19 ± 4 [*]

The mean sums ± SD, each category included seven questions.
[*] Difference within row ($P = 0.001$).

Table 5

Correlations of the Interpersonal Reactivity Index (IRI) empathy towards humans and empathy towards animals (subscales and sum) and mean pain scores, $P < 0.05$.

	Human IRI				Animal IRI			Pain score
	FS	PD	EC	PT	EC	PT	Sum	
Human IRI sum	0.78	0.41	0.75	0.64	0.39	0.42	0.45	ns
Human IRI FS		ns	0.43	0.31	0.33	0.32	0.37	0.16
Human IRI PD			ns	ns	ns	ns	ns	ns
Human IRI EC				0.48	0.53	0.38	0.51	0.19
Human IRI PT					0.21	0.48	0.38	ns
Animal IRI EC						0.60	0.91	0.23
Animal IRI PT							0.88	0.16
Animal IRI sum								0.23

FS, fantasy; PD, personal distress; EC, empathic concern; PT, perspective taking.

recommendations (for example, Stock et al., 2013). In this survey the percentage of veterinarians prepared to use this type of pain treatment is greater than reported from other countries such as the United States, Canada and the UK (Huxley and Whay, 2006; Hewson et al., 2007b; Fajt et al., 2011). Both Finnish production animal veterinarians and clinical phase students disagreed strongly with the statement '*The calf requires no pain medication for disbudding*', which indicated that both groups consider pain alleviation an important issue. Parallel to this, the respondents also considered '*Animal welfare important to them in their work*'.

Thomsen et al. (2012) reported highly positive attitudes towards use of analgesics in dairy cows by Danish veterinarians, which suggest a high animal welfare awareness among Nordic veterinarians. This awareness was also reflected in the scores for disbudding pain without medication which were higher in this study than those reported in the UK and the US (Huxley and Whay, 2006; Fajt et al., 2011). The relatively high sensitivity to pain revealed in current survey may be partly driven by the large proportion of females within veterinary profession in Finland. Although not significant in our sample, the effect of sex has been reported before, with females showing better pain recognition skills (Capner et al., 1999; Huxley and Whay, 2006; Kielland et al., 2009; Wikman et al., 2013).

Veterinarians with a production animal orientation may rank animal pain lower than veterinarians in general (Kielland et al., 2009). In addition, production animals are often assumed to be less sensitive to pain compared to pets (Raekallio et al., 2003; Huxley and Whay, 2006; Vinuela-Fernandez et al., 2007). However, the majority of respondents in this study contradicted in this regard.

Conclusions

Scoring of cattle pain by veterinary students and production-animal veterinarians was associated with empathy towards both animals and humans. A majority of Finnish veterinarians tested recognized and intended to treat cattle disbudding pain well, and animals were shown to be potent stimuli for empathy with veter-inarians who demonstrated higher empathy towards animals than humans.

Conflict of interest statement

None of the authors of this paper has a financial of personal relationship with other people or organizations that could inappropriately influence or bias the content of the paper.

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